Data set 7a2

WA 2917
12-7-92
8a

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

December 7, 1992

To: BURLINGTON ENVIRONMENTAL ENGINEERING

PROJECT NUMBER: 624878

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 27678

Samples were taken on 10/8/92, and received at SAS on 10/9/92. The samples were analyzed for semivolatile organics by EPA 8270, total petroleum hydrocarbons by EPA 418.1 modified for soils, and total petroleum fuel hydrocarbons by EPA 8015 modified.

SEMIVOLATILE ORGANICS-
Samples -1, -2, -3, -4, -5, -6, and -7 were extracted on 10/19/92, and analyzed on 10/25/92 using EPA method 8270. Both sample extraction and analysis were within holding times. Sample -4 was diluted due to high matrix interferences, causing all compounds to be below the PQL's. Di-n-butylphthalate was found in the method blank at levels above the PQL. This was flagged as B on all sample results. This compound is a common laboratory contaminant. Di-n-butylphthalate failed the quality control limits for duplicate RPD, and was flagged X4a to note this. All other quality control parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS-
Samples -1, -2, -3, -4, -5, -6, and -7 were extracted on 10/14/92, and analyzed on 10/22/92 by EPA method 8015 modified, both within the holding times. All samples were flagged X2, noting the non-typical elution patterns. These samples carried over from the Diesel range organics into heavier hydrocarbon ranges. Sample -4 was flagged E in addition, noting the sample concentration exceeded the calibration range, so this should be considered an estimated quantity. Sample -4 also had X10 flagged on the surrogates, noting the matrix interferences in the sample caused the surrogate recoveries to exceed QC limits. All other quality control parameters were within acceptance limits.

TOTAL PETROLEUM HYDROCARBONS-
Samples -1, -2, -3, -4, -5, -6, and -7 were extracted and analyzed on 10/13/92, both within holding times. The samples were analyzed using EPA method 418.1 modified for soils. All quality control parameters were met.

SOUND ANALYTICAL SERVICES, INC.

All samples were dry weight corrected.

No blank correction was used

Data qualifier flags are included in the quality control package.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental Engineering

Date: December 1, 1992

Report On: Analysis of Soil

Lab No.: 27678

IDENTIFICATION:

Samples Received on 10-09-92

Project: 624878 Pier 91

ANALYSIS:

Lab No. 27678-1

Client ID: CP-114-2-4

Semivolatile Organics Per EPA SW-846 Method 8270

Date Extracted: 10-19-92

Date Analyzed: 10-25-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
108-95-2	Phenol	ND	680	
111-44-4	bis(2-Chloroethyl) ether	ND	680	
95-57-8	2-Chlorophenol	ND	680	
541-73-1	1,3-Dichlorobenzene	ND	680	
106-46-7	1,4-Dichlorobenzene	ND	680	
100-51-6	Benzyl Alcohol	ND	1,400	
95-50-1	1,2-Dichlorobenzene	ND	680	
95-48-7	2-Methylphenol	ND	680	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	680	
106-44-5	4-Methylphenol	ND	680	
621-64-7	N-Nitroso-Di-N-propylamine	ND	680	
67-72-1	Hexachloroethane	ND	680	
98-95-3	Nitrobenzene	ND	680	
78-59-1	Isophorone	ND	680	
88-75-5	2-Nitrophenol	ND	680	
105-67-9	2,4-Dimethylphenol	ND	680	
65-85-0	Benzoic Acid	ND	3,400	
111-91-1	bis(2-Chloroethoxy)methane	ND	680	
120-83-2	2,4-Dichlorophenol	ND	680	
120-82-1	1,2,4-Trichlorobenzene	ND	680	
91-20-3	Naphthalene	ND	680	
106-47-8	4-Chloroaniline	ND	1,400	
87-68-3	Hexachlorobutadiene	ND	680	
59-50-7	4-Chloro-3-methylphenol	ND	1,400	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-1 Client ID: CP-114-2-4

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
91-57-6	2-Methylnaphthalene	ND	680	
77-47-4	Hexachlorocyclopentadiene	ND	680	
88-06-2	2,4,6-Trichlorophenol	ND	680	
95-95-4	2,4,5-Trichlorophenol	ND	680	
91-58-7	2-Chloronaphthalene	ND	680	
88-74-4	2-Nitroaniline	ND	3,400	
131-11-3	Dimethyl phthalate	ND	680	
208-96-8	Acenaphthylene	ND	680	
606-20-2	2,6-Dinitrotoluene	ND	680	
99-09-2	3-Nitroaniline	ND	3,400	
83-32-9	Acenaphthene	ND	680	
51-28-5	2,4-Dinitrophenol	ND	3,400	
100-02-7	4-Nitrophenol	ND	3,400	
132-64-9	Dibenzofuran	ND	680	
121-14-2	2,4-Dinitrotoluene	ND	680	
84-66-2	Diethylphthalate	ND	680	
7005-72-3	4-Chlorophenyl phenyl ether	ND	680	
86-73-7	Fluorene	ND	680	
100-01-6	4-Nitroaniline	ND	3,400	
534-52-1	4,6-Dinitro-2-methylphenol	ND	3,400	
86-30-6	N-Nitrosodiphenylamine	ND	680	
101-55-3	4-Bromophenyl phenyl ether	ND	680	
118-74-1	Hexachlorobenzene	ND	680	
87-86-5	Pentachlorophenol	ND	3,400	
85-01-8	Phenanthrene	ND	680	
120-12-7	Anthracene	ND	680	
84-74-2	Di-n-butylphthalate	4,500	680	B

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-1 Client ID: CP-114-2-4

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
206-44-0	Fluoranthene	ND	680	
129-00-0	Pyrene	ND	680	
85-68-7	Butyl benzyl phthalate	ND	680	
91-94-1	3,3'-Dichlorobenzidine	ND	1,400	
56-55-3	Benzo(a)anthracene	ND	680	
218-01-9	Chrysene	ND	680	
117-81-7	bis(2-ethylhexyl)phthalate	ND	680	
117-84-0	Di-n-octyl phthalate	ND	680	
205-99-2	Benzo(b)fluoranthene	ND	680	
207-08-9	Benzo(k)fluoranthene	ND	680	
50-32-8	Benzo(a)pyrene	ND	680	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	680	
53-70-3	Dibenz(a,h)anthracene	ND	680	
191-24-2	Benzo(g,h,i)perylene	ND	680	

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	87	35 - 114	23 - 120
2-Fluorobiphenyl	88	43 - 116	30 - 115
p-Terphenyl-d_{14}	96	33 - 141	18 - 137
Phenol-d_6	89	10 - 94	24 - 113
2-Fluorophenol	87	21 - 100	25 - 121
2,4,6-Tribromophenol	95	10 - 123	19 - 122

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-1 Client ID: CP-114-2-4

TPH Per EPA Method 418.1
Date Extracted: 10-13-92
Date Analyzed: 10-13-92

Total Petroleum Hydrocarbons, mg/kg	840

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 10-14-92
Date Analyzed: 10-22-92

Total Petroleum Fuel Hydrocarbons, mg/kg	1,300	X2
TPH as	Diesel, Heavy Oil	

SURROGATE RECOVERY, %		
1-chlorooctane	120	
o-terphenyl	207	X10

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-2 Client ID: CP-114-6-8

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 10-19-92
Date Analyzed: 10-27-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
108-95-2	Phenol	ND	780	
111-44-4	bis(2-Chloroethyl) ether	ND	780	
95-57-8	2-Chlorophenol	ND	780	
541-73-1	1,3-Dichlorobenzene	ND	780	
106-46-7	1,4-Dichlorobenzene	ND	780	
100-51-6	Benzyl Alcohol	ND	1,600	
95-50-1	1,2-Dichlorobenzene	ND	780	
95-48-7	2-Methylphenol	ND	780	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	780	
106-44-5	4-Methylphenol	ND	780	
621-64-7	N-Nitroso-Di-N-propylamine	ND	780	
67-72-1	Hexachloroethane	ND	780	
98-95-3	Nitrobenzene	ND	780	
78-59-1	Isophorone	ND	780	
88-75-5	2-Nitrophenol	ND	780	
105-67-9	2,4-Dimethylphenol	ND	780	
65-85-0	Benzoic Acid	ND	3,900	
111-91-1	bis(2-Chloroethoxy)methane	ND	780	
120-83-2	2,4-Dichlorophenol	ND	780	
120-82-1	1,2,4-Trichlorobenzene	ND	780	
91-20-3	Naphthalene	ND	780	
106-47-8	4-Chloroaniline	ND	1,600	
87-68-3	Hexachlorobutadiene	ND	780	
59-50-7	4-Chloro-3-methylphenol	ND	1,600	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-2 Client ID: CP-114-6-8

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
91-57-6	2-Methylnaphthalene	ND	780	
77-47-4	Hexachlorocyclopentadiene	ND	780	
88-06-2	2,4,6-Trichlorophenol	ND	780	
95-95-4	2,4,5-Trichlorophenol	ND	780	
91-58-7	2-Chloronaphthalene	ND	780	
88-74-4	2-Nitroaniline	ND	3,900	
131-11-3	Dimethyl phthalate	ND	780	
208-96-8	Acenaphthylene	ND	780	
606-20-2	2,6-Dinitrotoluene	ND	780	
99-09-2	3-Nitroaniline	ND	3,900	
83-32-9	Acenaphthene	ND	780	
51-28-5	2,4-Dinitrophenol	ND	3,900	
100-02-7	4-Nitrophenol	ND	3,900	
132-64-9	Dibenzofuran	ND	780	
121-14-2	2,4-Dinitrotoluene	ND	780	
84-66-2	Diethylphthalate	ND	780	
7005-72-3	4-Chlorophenyl phenyl ether	ND	780	
86-73-7	Fluorene	ND	780	
100-01-6	4-Nitroaniline	ND	3,900	
534-52-1	4,6-Dinitro-2-methylphenol	ND	3,900	
86-30-6	N-Nitrosodiphenylamine	ND	780	
101-55-3	4-Bromophenyl phenyl ether	ND	780	
118-74-1	Hexachlorobenzene	ND	780	
87-86-5	Pentachlorophenol	ND	3,900	
85-01-8	Phenanthrene	ND	780	
120-12-7	Anthracene	ND	780	
84-74-2	Di-n-butylphthalate	2,300	780	B

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-2 Client ID: CP-114-6-8

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
206-44-0	Fluoranthene	ND	780	
129-00-0	Pyrene	ND	780	
85-68-7	Butyl benzyl phthalate	ND	780	
91-94-1	3,3'-Dichlorobenzidine	ND	1,600	
56-55-3	Benzo(a)anthracene	ND	780	
218-01-9	Chrysene	ND	780	
117-81-7	bis(2-ethylhexyl)phthalate	ND	780	
117-84-0	Di-n-octyl phthalate	ND	780	
205-99-2	Benzo(b)fluoranthene	ND	780	
207-08-9	Benzo(k)fluoranthene	ND	780	
50-32-8	Benzo(a)pyrene	ND	780	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	780	
53-70-3	Dibenz(a,h)anthracene	ND	780	
191-24-2	Benzo(g,h,i)perylene	ND	780	

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	78	35 - 114	23 - 120
2-Fluorobiphenyl	91	43 - 116	30 - 115
p-Terphenyl-d_{14}	98	33 - 141	18 - 137
Phenol-d_6	63	10 - 94	24 - 113
2-Fluorophenol	75	21 - 100	25 - 121
2,4,6-Tribromophenol	110	10 - 123	19 - 122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-2 Client ID: CP-114-6-8

TPH Per EPA Method 418.1
Date Extracted: 10-13-92
Date Analyzed: 10-13-92

Total Petroleum Hydrocarbons, mg/kg	480

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 10-14-92
Date Analyzed: 10-22-92

Total Petroleum Fuel Hydrocarbons, mg/kg	1,900	X2
TPH as	Diesel, Heavy Oil	

SURROGATE RECOVERY, %	
1-chlorooctane	116
o-terphenyl	208

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-3 Client ID: CP-115A-2-4

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 10-19-92
Date Analyzed: 10-24-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
108-95-2	Phenol	ND	710	
111-44-4	bis(2-Chloroethyl) ether	ND	710	
95-57-8	2-Chlorophenol	ND	710	
541-73-1	1,3-Dichlorobenzene	ND	710	
106-46-7	1,4-Dichlorobenzene	ND	710	
100-51-6	Benzyl Alcohol	ND	1,400	
95-50-1	1,2-Dichlorobenzene	ND	710	
95-48-7	2-Methylphenol	ND	710	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	710	
106-44-5	4-Methylphenol	ND	710	
621-64-7	N-Nitroso-Di-N-propylamine	ND	710	
67-72-1	Hexachloroethane	ND	710	
98-95-3	Nitrobenzene	ND	710	
78-59-1	Isophorone	ND	710	
88-75-5	2-Nitrophenol	ND	710	
105-67-9	2,4-Dimethylphenol	ND	710	
65-85-0	Benzoic Acid	ND	3,500	
111-91-1	bis(2-Chloroethoxy)methane	ND	710	
120-83-2	2,4-Dichlorophenol	ND	710	
120-82-1	1,2,4-Trichlorobenzene	ND	710	
91-20-3	Naphthalene	ND	710	
106-47-8	4-Chloroaniline	ND	1,400	
87-68-3	Hexachlorobutadiene	ND	710	
59-50-7	4-Chloro-3-methylphenol	ND	1,400	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-3 Client ID: CP-115A-2-4

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
91-57-6	2-Methylnaphthalene	ND	710	
77-47-4	Hexachlorocyclopentadiene	ND	710	
88-06-2	2,4,6-Trichlorophenol	ND	710	
95-95-4	2,4,5-Trichlorophenol	ND	710	
91-58-7	2-Chloronaphthalene	ND	710	
88-74-4	2-Nitroaniline	ND	3,500	
131-11-3	Dimethyl phthalate	ND	710	
208-96-8	Acenaphthylene	ND	710	
606-20-2	2,6-Dinitrotoluene	ND	710	
99-09-2	3-Nitroaniline	ND	3,500	
83-32-9	Acenaphthene	ND	710	
51-28-5	2,4-Dinitrophenol	ND	3,500	
100-02-7	4-Nitrophenol	ND	3,500	
132-64-9	Dibenzofuran	ND	710	
121-14-2	2,4-Dinitrotoluene	ND	710	
84-66-2	Diethylphthalate	ND	710	
7005-72-3	4-Chlorophenyl phenyl ether	ND	710	
86-73-7	Fluorene	ND	710	
100-01-6	4-Nitroaniline	ND	3,500	
534-52-1	4,6-Dinitro-2-methylphenol	ND	3,500	
86-30-6	N-Nitrosodiphenylamine	ND	710	
101-55-3	4-Bromophenyl phenyl ether	ND	710	
118-74-1	Hexachlorobenzene	ND	710	
87-86-5	Pentachlorophenol	ND	3,500	
85-01-8	Phenanthrene	ND	710	
120-12-7	Anthracene	ND	710	
84-74-2	Di-n-butylphthalate	1,400	710	B

ND - Not Detected

Continued . . . . .

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-3 Client ID: CP-115A-2-4

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
206-44-0	Fluoranthene	ND	710	
129-00-0	Pyrene	ND	710	
85-68-7	Butyl benzyl phthalate	ND	710	
91-94-1	3,3'-Dichlorobenzidine	ND	1,400	
56-55-3	Benzo(a)anthracene	ND	710	
218-01-9	Chrysene	ND	710	
117-81-7	bis(2-ethylhexyl)phthalate	ND	710	
117-84-0	Di-n-octyl phthalate	ND	710	
205-99-2	Benzo(b)fluoranthene	ND	710	
207-08-9	Benzo(k)fluoranthene	ND	710	
50-32-8	Benzo(a)pyrene	ND	710	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	710	
53-70-3	Dibenz(a,h)anthracene	ND	710	
191-24-2	Benzo(g,h,i)perylene	ND	710	

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	82	35 - 114	23 - 120
2-Fluorobiphenyl	85	43 - 116	30 - 115
p-Terphenyl-d_{14}	91	33 - 141	18 - 137
Phenol-d_6	90	10 - 94	24 - 113
2-Fluorophenol	84	21 - 100	25 - 121
2,4,6-Tribromophenol	81	10 - 123	19 - 122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-3 Client ID: CP-115A-2-4

TPH Per EPA Method 418.1
Date Extracted: 10-13-92
Date Analyzed: 10-13-92

Total Petroleum Hydrocarbons, mg/kg	36

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 10-14-92
Date Analyzed: 10-22-92

Total Petroleum Fuel Hydrocarbons, mg/kg	50	X2
TPH as ~~Diesel~~ Heavy Oil		

SURROGATE RECOVERY, %	
1-chlorooctane	95
o-terphenyl	104

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-4 Client ID: CP-115A-6-8

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 10-19-92
Date Analyzed: 10-30-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
108-95-2	Phenol	ND	4,000	
111-44-4	bis(2-Chloroethyl) ether	ND	4,000	
95-57-8	2-Chlorophenol	ND	4,000	
541-73-1	1,3-Dichlorobenzene	ND	4,000	
106-46-7	1,4-Dichlorobenzene	ND	4,000	
100-51-6	Benzyl Alcohol	ND	8,000	
95-50-1	1,2-Dichlorobenzene	ND	4,000	
95-48-7	2-Methylphenol	ND	4,000	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	4,000	
106-44-5	4-Methylphenol	ND	4,000	
621-64-7	N-Nitroso-Di-N-propylamine	ND	4,000	
67-72-1	Hexachloroethane	ND	4,000	
98-95-3	Nitrobenzene	ND	4,000	
78-59-1	Isophorone	ND	4,000	
88-75-5	2-Nitrophenol	ND	4,000	
105-67-9	2,4-Dimethylphenol	ND	4,000	
65-85-0	Benzoic Acid	ND	20,000	
111-91-1	bis(2-Chloroethoxy)methane	ND	4,000	
120-83-2	2,4-Dichlorophenol	ND	4,000	
120-82-1	1,2,4-Trichlorobenzene	ND	4,000	
91-20-3	Naphthalene	ND	4,000	
106-47-8	4-Chloroaniline	ND	8,000	
87-68-3	Hexachlorobutadiene	ND	4,000	
59-50-7	4-Chloro-3-methylphenol	ND	8,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-4 Client ID: CP-115A-6-8

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
91-57-6	2-Methylnaphthalene	ND	4,000	
77-47-4	Hexachlorocyclopentadiene	ND	4,000	
88-06-2	2,4,6-Trichlorophenol	ND	4,000	
95-95-4	2,4,5-Trichlorophenol	ND	4,000	
91-58-7	2-Chloronaphthalene	ND	4,000	
88-74-4	2-Nitroaniline	ND	20,000	
131-11-3	Dimethyl phthalate	ND	4,000	
208-96-8	Acenaphthylene	ND	4,000	
606-20-2	2,6-Dinitrotoluene	ND	4,000	
99-09-2	3-Nitroaniline	ND	20,000	
83-32-9	Acenaphthene	ND	4,000	
51-28-5	2,4-Dinitrophenol	ND	20,000	
100-02-7	4-Nitrophenol	ND	20,000	
132-64-9	Dibenzofuran	ND	4,000	
121-14-2	2,4-Dinitrotoluene	ND	4,000	
84-66-2	Diethylphthalate	ND	4,000	
7005-72-3	4-Chlorophenyl phenyl ether	ND	4,000	
86-73-7	Fluorene	ND	4,000	
100-01-6	4-Nitroaniline	ND	20,000	
534-52-1	4,6-Dinitro-2-methylphenol	ND	20,000	
86-30-6	N-Nitrosodiphenylamine	ND	4,000	
101-55-3	4-Bromophenyl phenyl ether	ND	4,000	
118-74-1	Hexachlorobenzene	ND	4,000	
87-86-5	Pentachlorophenol	ND	20,000	
85-01-8	Phenanthrene	ND	4,000	
120-12-7	Anthracene	ND	4,000	
84-74-2	Di-n-butylphthalate	ND	4,000	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-4 Client ID: CP-115A-6-8

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
206-44-0	Fluoranthene	ND	4,000	
129-00-0	Pyrene	ND	4,000	
85-68-7	Butyl benzyl phthalate	ND	4,000	
91-94-1	3,3'-Dichlorobenzidine	ND	8,000	
56-55-3	Benzo(a)anthracene	ND	4,000	
218-01-9	Chrysene	ND	4,000	
117-81-7	bis(2-ethylhexyl)phthalate	ND	4,000	
117-84-0	Di-n-octyl phthalate	ND	4,000	
205-99-2	Benzo(b)fluoranthene	ND	4,000	
207-08-9	Benzo(k)fluoranthene	ND	4,000	
50-32-8	Benzo(a)pyrene	ND	4,000	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	4,000	
53-70-3	Dibenz(a,h)anthracene	ND	4,000	
191-24-2	Benzo(g,h,i)perylene	ND	4,000	

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	100	35 - 114	23 - 120
2-Fluorobiphenyl	120	43 - 116	30 - 115
p-Terphenyl-d_{14}	92	33 - 141	18 - 137
Phenol-d_6	88	10 - 94	24 - 113
2-Fluorophenol	89	21 - 100	25 - 121
2,4,6-Tribromophenol	90	10 - 123	19 - 122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-4 Client ID: CP-115A-6-8

TPH Per EPA Method 418.1
Date Extracted: 10-13-92
Date Analyzed: 10-13-92

Total Petroleum Hydrocarbons, mg/kg	13,000	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 10-14-92
Date Analyzed: 10-22-92

Total Petroleum Fuel Hydrocarbons, mg/kg	22,000	E, X2

TPH as Aged Gasoline, Diesel, Heavy Oil

SURROGATE RECOVERY, %		
1-chlorooctane	288	X10
o-terphenyl	233	X10

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-5 Client ID: CP-122A-2-4

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 10-19-92
Date Analyzed: 10-24-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
108-95-2	Phenol	ND	720	
111-44-4	bis(2-Chloroethyl) ether	ND	720	
95-57-8	2-Chlorophenol	ND	720	
541-73-1	1,3-Dichlorobenzene	ND	720	
106-46-7	1,4-Dichlorobenzene	ND	720	
100-51-6	Benzyl Alcohol	ND	1,400	
95-50-1	1,2-Dichlorobenzene	ND	720	
95-48-7	2-Methylphenol	ND	720	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	720	
106-44-5	4-Methylphenol	ND	720	
621-64-7	N-Nitroso-Di-N-propylamine	ND	720	
67-72-1	Hexachloroethane	ND	720	
98-95-3	Nitrobenzene	ND	720	
78-59-1	Isophorone	ND	720	
88-75-5	2-Nitrophenol	ND	720	
105-67-9	2,4-Dimethylphenol	ND	720	
65-85-0	Benzoic Acid	ND	3,600	
111-91-1	bis(2-Chloroethoxy)methane	ND	720	
120-83-2	2,4-Dichlorophenol	ND	720	
120-82-1	1,2,4-Trichlorobenzene	ND	720	
91-20-3	Naphthalene	ND	720	
106-47-8	4-Chloroaniline	ND	1,400	
87-68-3	Hexachlorobutadiene	ND	720	
59-50-7	4-Chloro-3-methylphenol	ND	1,400	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-5 Client ID: CP-122A-2-4

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
91-57-6	2-Methylnaphthalene	ND	720	
77-47-4	Hexachlorocyclopentadiene	ND	720	
88-06-2	2,4,6-Trichlorophenol	ND	720	
95-95-4	2,4,5-Trichlorophenol	ND	720	
91-58-7	2-Chloronaphthalene	ND	720	
88-74-4	2-Nitroaniline	ND	3,600	
131-11-3	Dimethyl phthalate	ND	720	
208-96-8	Acenaphthylene	ND	720	
606-20-2	2,6-Dinitrotoluene	ND	720	
99-09-2	3-Nitroaniline	ND	3,600	
83-32-9	Acenaphthene	ND	720	
51-28-5	2,4-Dinitrophenol	ND	3,600	
100-02-7	4-Nitrophenol	ND	3,600	
132-64-9	Dibenzofuran	ND	720	
121-14-2	2,4-Dinitrotoluene	ND	720	
84-66-2	Diethylphthalate	ND	720	
7005-72-3	4-Chlorophenyl phenyl ether	ND	720	
86-73-7	Fluorene	ND	720	
100-01-6	4-Nitroaniline	ND	3,600	
534-52-1	4,6-Dinitro-2-methylphenol	ND	3,600	
86-30-6	N-Nitrosodiphenylamine	ND	720	
101-55-3	4-Bromophenyl phenyl ether	ND	720	
118-74-1	Hexachlorobenzene	ND	720	
87-86-5	Pentachlorophenol	ND	3,600	
85-01-8	Phenanthrene	ND	720	
120-12-7	Anthracene	ND	720	
84-74-2	Di-n-butylphthalate	170	720	B,J

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-5 Client ID: CP-122A-2-4

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
206-44-0	Fluoranthene	ND	720	
129-00-0	Pyrene	ND	720	
85-68-7	Butyl benzyl phthalate	ND	720	
91-94-1	3,3'-Dichlorobenzidine	ND	1,400	
56-55-3	Benzo(a)anthracene	ND	720	
218-01-9	Chrysene	ND	720	
117-81-7	bis(2-ethylhexyl)phthalate	ND	720	
117-84-0	Di-n-octyl phthalate	ND	720	
205-99-2	Benzo(b)fluoranthene	ND	720	
207-08-9	Benzo(k)fluoranthene	ND	720	
50-32-8	Benzo(a)pyrene	ND	720	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	720	
53-70-3	Dibenz(a,h)anthracene	ND	720	
191-24-2	Benzo(g,h,i)perylene	ND	720	

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	66	35 - 114	23 - 120
2-Fluorobiphenyl	66	43 - 116	30 - 115
p-Terphenyl-d_{14}	76	33 - 141	18 - 137
Phenol-d_6	82	10 - 94	24 - 113
2-Fluorophenol	71	21 - 100	25 - 121
2,4,6-Tribromophenol	78	10 - 123	19 - 122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-5 Client ID: CP-122A-2-4

TPH Per EPA Method 418.1
Date Extracted: 10-13-92
Date Analyzed: 10-13-92

Total Petroleum Hydrocarbons, mg/kg	36

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 10-14-92
Date Analyzed: 10-22-92

Total Petroleum Fuel Hydrocarbons, mg/kg	140	X2
TPH as	Diesel, Heavy Oil	

SURROGATE RECOVERY, %	
1-chlorooctane	94
o-terphenyl	96

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-6 Client ID: CP-122A-6-8

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 10-19-92
Date Analyzed: 10-27-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
108-95-2	Phenol	ND	790	
111-44-4	bis(2-Chloroethyl) ether	ND	790	
95-57-8	2-Chlorophenol	ND	790	
541-73-1	1,3-Dichlorobenzene	ND	790	
106-46-7	1,4-Dichlorobenzene	ND	790	
100-51-6	Benzyl Alcohol	ND	1,600	
95-50-1	1,2-Dichlorobenzene	ND	790	
95-48-7	2-Methylphenol	ND	790	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	790	
106-44-5	4-Methylphenol	ND	790	
621-64-7	N-Nitroso-Di-N-propylamine	ND	790	
67-72-1	Hexachloroethane	ND	790	
98-95-3	Nitrobenzene	ND	790	
78-59-1	Isophorone	ND	790	
88-75-5	2-Nitrophenol	ND	790	
105-67-9	2,4-Dimethylphenol	ND	790	
65-85-0	Benzoic Acid	ND	4,000	
111-91-1	bis(2-Chloroethoxy)methane	ND	790	
120-83-2	2,4-Dichlorophenol	ND	790	
120-82-1	1,2,4-Trichlorobenzene	ND	790	
91-20-3	Naphthalene	ND	790	
106-47-8	4-Chloroaniline	ND	1,600	
87-68-3	Hexachlorobutadiene	ND	790	
59-50-7	4-Chloro-3-methylphenol	ND	1,600	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-6 Client ID: CP-122A-6-8

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
91-57-6	2-Methylnaphthalene	ND	790	
77-47-4	Hexachlorocyclopentadiene	ND	790	
88-06-2	2,4,6-Trichlorophenol	ND	790	
95-95-4	2,4,5-Trichlorophenol	ND	790	
91-58-7	2-Chloronaphthalene	ND	790	
88-74-4	2-Nitroaniline	ND	4,000	
131-11-3	Dimethyl phthalate	ND	790	
208-96-8	Acenaphthylene	ND	790	
606-20-2	2,6-Dinitrotoluene	ND	790	
99-09-2	3-Nitroaniline	ND	4,000	
83-32-9	Acenaphthene	ND	790	
51-28-5	2,4-Dinitrophenol	ND	4,000	
100-02-7	4-Nitrophenol	ND	4,000	
132-64-9	Dibenzofuran	ND	790	
121-14-2	2,4-Dinitrotoluene	ND	790	
84-66-2	Diethylphthalate	ND	790	
7005-72-3	4-Chlorophenyl phenyl ether	ND	790	
86-73-7	Fluorene	ND	790	
100-01-6	4-Nitroaniline	ND	4,000	
534-52-1	4,6-Dinitro-2-methylphenol	ND	4,000	
86-30-6	N-Nitrosodiphenylamine	ND	790	
101-55-3	4-Bromophenyl phenyl ether	ND	790	
118-74-1	Hexachlorobenzene	ND	790	
87-86-5	Pentachlorophenol	ND	4,000	
85-01-8	Phenanthrene	ND	790	
120-12-7	Anthracene	ND	790	
84-74-2	Di-n-butylphthalate	2,300	790	B

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-6 Client ID: CP-122A-6-8

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
206-44-0	Fluoranthene	ND	790	
129-00-0	Pyrene	ND	790	
85-68-7	Butyl benzyl phthalate	ND	790	
91-94-1	3,3'-Dichlorobenzidine	ND	1,600	
56-55-3	Benzo(a)anthracene	ND	790	
218-01-9	Chrysene	ND	790	
117-81-7	bis(2-ethylhexyl)phthalate	ND	790	
117-84-0	Di-n-octyl phthalate	ND	790	
205-99-2	Benzo(b)fluoranthene	ND	790	
207-08-9	Benzo(k)fluoranthene	ND	790	
50-32-8	Benzo(a)pyrene	ND	790	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	790	
53-70-3	Dibenz(a,h)anthracene	ND	790	
191-24-2	Benzo(g,h,i)perylene	ND	790	

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	67	35 - 114	23 - 120
2-Fluorobiphenyl	76	43 - 116	30 - 115
p-Terphenyl-d_{14}	93	33 - 141	18 - 137
Phenol-d_6	53	10 - 94	24 - 113
2-Fluorophenol	61	21 - 100	25 - 121
2,4,6-Tribromophenol	73	10 - 123	19 - 122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-6 Client ID: CP-122A-6-8

TPH Per EPA Method 418.1
Date Extracted: 10-13-92
Date Analyzed: 10-13-92

Total Petroleum Hydrocarbons, mg/kg	180

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 10-14-92
Date Analyzed: 10-22-92

Total Petroleum Fuel Hydrocarbons, mg/kg	415	X2

TPH as Diesel, Heavy Oil

SURROGATE RECOVERY, %	
1-chlorooctane	53
o-terphenyl	101

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-7 Client ID: CP-922A-6-8

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 10-19-92
Date Analyzed: 10-27-92

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
108-95-2	Phenol	ND	810	
111-44-4	bis(2-Chloroethyl) ether	ND	810	
95-57-8	2-Chlorophenol	ND	810	
541-73-1	1,3-Dichlorobenzene	ND	810	
106-46-7	1,4-Dichlorobenzene	ND	810	
100-51-6	Benzyl Alcohol	ND	1,600	
95-50-1	1,2-Dichlorobenzene	ND	810	
95-48-7	2-Methylphenol	ND	810	
39638-32-9	bis(2-Chloroisopropyl)ether	ND	810	
106-44-5	4-Methylphenol	ND	810	
621-64-7	N-Nitroso-Di-N-propylamine	ND	810	
67-72-1	Hexachloroethane	ND	810	
98-95-3	Nitrobenzene	ND	810	
78-59-1	Isophorone	ND	810	
88-75-5	2-Nitrophenol	ND	810	
105-67-9	2,4-Dimethylphenol	ND	810	
65-85-0	Benzoic Acid	ND	4,100	
111-91-1	bis(2-Chloroethoxy)methane	ND	810	
120-83-2	2,4-Dichlorophenol	ND	810	
120-82-1	1,2,4-Trichlorobenzene	ND	810	
91-20-3	Naphthalene	ND	810	
106-47-8	4-Chloroaniline	ND	1,600	
87-68-3	Hexachlorobutadiene	ND	810	
59-50-7	4-Chloro-3-methylphenol	ND	1,600	

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-7 Client ID: CP-922A-6-8

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
91-57-6	2-Methylnaphthalene	ND	810	
77-47-4	Hexachlorocyclopentadiene	ND	810	
88-06-2	2,4,6-Trichlorophenol	ND	810	
95-95-4	2,4,5-Trichlorophenol	ND	810	
91-58-7	2-Chloronaphthalene	ND	810	
88-74-4	2-Nitroaniline	ND	4,100	
131-11-3	Dimethyl phthalate	ND	810	
208-96-8	Acenaphthylene	ND	810	
606-20-2	2,6-Dinitrotoluene	ND	810	
99-09-2	3-Nitroaniline	ND	4,100	
83-32-9	Acenaphthene	ND	810	
51-28-5	2,4-Dinitrophenol	ND	4,100	
100-02-7	4-Nitrophenol	ND	4,100	
132-64-9	Dibenzofuran	ND	810	
121-14-2	2,4-Dinitrotoluene	ND	810	
84-66-2	Diethylphthalate	ND	810	
7005-72-3	4-Chlorophenyl phenyl ether	ND	810	
86-73-7	Fluorene	ND	810	
100-01-6	4-Nitroaniline	ND	4,100	
534-52-1	4,6-Dinitro-2-methylphenol	ND	4,100	
86-30-6	N-Nitrosodiphenylamine	ND	810	
101-55-3	4-Bromophenyl phenyl ether	ND	810	
118-74-1	Hexachlorobenzene	ND	810	
87-86-5	Pentachlorophenol	ND	4,100	
85-01-8	Phenanthrene	ND	810	
120-12-7	Anthracene	ND	810	
84-74-2	Di-n-butylphthalate	1,900	810	B

ND - Not Detected

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-7 Client ID: CP-922A-6-8

EPA Method 8270 Continued

CAS No.	Compounds	Concentration ug/kg	PQL	Flag
206-44-0	Fluoranthene	ND	810	
129-00-0	Pyrene	ND	810	
85-68-7	Butyl benzyl phthalate	ND	810	
91-94-1	3,3'-Dichlorobenzidine	ND	1,600	
56-55-3	Benzo(a)anthracene	ND	810	
218-01-9	Chrysene	ND	810	
117-81-7	bis(2-ethylhexyl)phthalate	ND	810	
117-84-0	Di-n-octyl phthalate	ND	810	
205-99-2	Benzo(b)fluoranthene	ND	810	
207-08-9	Benzo(k)fluoranthene	ND	810	
50-32-8	Benzo(a)pyrene	ND	810	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	810	
53-70-3	Dibenz(a,h)anthracene	ND	810	
191-24-2	Benzo(g,h,i)perylene	ND	810	

ND - Not Detected
PQL - Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

Results are reported on a dry weight basis.

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	65	35 - 114	23 - 120
2-Fluorobiphenyl	71	43 - 116	30 - 115
p-Terphenyl-d_{14}	83	33 - 141	18 - 137
Phenol-d_6	52	10 - 94	24 - 113
2-Fluorophenol	58	21 - 100	25 - 121
2,4,6-Tribromophenol	73	10 - 123	19 - 122

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Engineering
Project: 624878

Lab No. 27678
December 1, 1992

Lab No. 27678-7 Client ID: CP-922A-6-8

TPH Per EPA Method 418.1
Date Extracted: 10-13-92
Date Analyzed: 10-13-92

Total Petroleum Hydrocarbons, mg/kg	200

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 10-14-92
Date Analyzed: 10-22-92

Total Petroleum Fuel Hydrocarbons, mg/kg	400
TPH as	Diesel, Heavy Oil

SURROGATE RECOVERY, %	
1-chlorooctane	90
o-terphenyl	97

SOUND ANALYTICAL SERVICES

DENNIS L. BEAN

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

TPH by Method 418.1

Client: Burlington Environmental - Engineering
Lab No: 27678qc1
Matrix: Soil
Units: mg/kg
Date: December 1, 1992

DUPLICATE

Dup No. 27678-7

Parameter	Sample(S)	Duplicate(D)	RPD
Total Petroleum Hydrocarbons	200	190	5.1

RPD = Relative Percent Difference
= [(S - D) / ((S + D) / 2] x 100

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 27678-7

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	RPD
Total Petroleum Hydrocarbons	200	1,100	930	96.8	1,000	9.5

%R = Percent Recovery
= [(MS - SR) / SA] x 100

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2] x 100

METHOD BLANK

Parameter	Blank Value
Total Petroleum Hydrocarbons	< 10

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons by Method 8015

Client: Burlington Environmental - Engineering
Lab No: 27678qc2
Matrix: Soil
Units: mg/kg
Date: December 1, 1992

DUPLICATE

Dup. No. 27678-7

Parameter	Sample(S)	Duplicate(D)	RPD
Total Petroleum Fuel Hydrocarbons	400	370	7.8
SURROGATE RECOVERY%			
1-chlorooctane	90	53	
o-terphenyl	97	107	

RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 27678-7

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	RPD
Total Petroleum Fuel Hydrocarbons	400	940	405	130	1,100	16

%R = Percent Recovery
= [(MS - SR) / SA] x 100
RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2] x 100

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons by Method 8015

Client: Burlington Environmental - Engineering
Lab No: 27678qc2
Matrix: Soil
Units: mg/kg
Date: December 1, 1992

METHOD BLANK

Blank No. 003F0101.D

Parameter	Blank Value
Total Petroleum Fuel Hydrocarbons	< 10
SURROGATE RECOVERY%	
1-chlorooctane	90
o-terphenyl	89

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental - Engineering
Lab No: 27678qc3
Units: ug/kg
Date: December 1, 1992

METHOD BLANK

Compound	Blank Value	PQL	Flags
Phenol	ND	660	
bis(2-Chloroethyl) ether	ND	660	
2-Chlorophenol	ND	660	
1,3-Dichlorobenzene	ND	660	
1,4-Dichlorobenzene	ND	660	
Benzyl Alcohol	ND	1,300	
1,2-Dichlorobenzene	ND	660	
2-Methylphenol	ND	660	
bis(2-Chloroisopropyl)ether	ND	660	
4-Methylphenol	ND	660	
N-Nitroso-Di-N-propylamine	ND	660	
Hexachloroethane	ND	660	
Nitrobenzene	ND	660	
Isophorone	ND	660	
2-Nitrophenol	ND	660	
2,4-Dimethylphenol	ND	660	
Benzoic Acid	ND	3,300	
bis(2-Chloroethoxy)methane	ND	660	
2,4-Dichlorophenol	ND	660	
1,2,4-Trichlorobenzene	ND	660	
Naphthalene	ND	660	
4-Chloroaniline	ND	1,300	
Hexachlorobutadiene	ND	660	
4-Chloro-3-methylphenol	ND	1,300	
2-Methylnaphthalene	ND	660	
Hexachlorocyclopentadiene	ND	660	
2,4,6-Trichlorophenol	ND	660	
2,4,5-Trichlorophenol	ND	660	
2-Chloronaphthalene	ND	660	
2-Nitroaniline	ND	3,300	
Dimethyl phthalate	ND	660	
Acenaphthylene	ND	660	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental - Engineering
Lab No: 27678qc3
Units: ug/kg
Date: December 1, 1992

METHOD BLANK

Compound	Blank Value	PQL	Flags
3-Nitroaniline	ND	3,300	
Acenaphthene	ND	660	
2,4-Dinitrophenol	ND	3,300	
4-Nitrophenol	ND	3,300	
Dibenzofuran	ND	660	
2,4-Dinitrotoluene	ND	660	
2,6-Dinitrotoluene	ND	660	
Diethylphthalate	ND	660	
4-Chlorophenyl phenyl ether	ND	660	
Fluorene	ND	660	
4-Nitroaniline	ND	3,300	
4,6-Dinitro-2-methylphenol	ND	3,300	
N-Nitrosodiphenylamine	ND	660	
4-Bromophenyl phenyl ether	ND	660	
Hexachlorobenzene	ND	660	
Pentachlorophenol	ND	3,300	
Phenanthrene	ND	660	
Anthracene	ND	660	
Di-n-butylphthalate	3,200	660	
Fluoranthene	ND	660	
Pyrene	ND	660	
Butyl benzyl phthalate	ND	660	
3,3'-Dichlorobenzidine	ND	1,300	
Benzo(a)anthracene	ND	660	
bis(2-ethylhexyl)phthalate	ND	660	
Chrysene	ND	660	
Di-n-octyl phthalate	ND	660	
Benzo(b)fluoranthene	ND	660	
Benzo(k)fluoranthene	ND	660	
Benzo(a)pyrene	ND	660	
Indeno(1,2,3-cd)pyrene	ND	660	
Dibenz(a,h)anthracene	ND	660	
Benzo(g,h,i)perylene	ND	660	

Continued. . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental - Engineering
Lab No: 27678qc3
Units: ug/kg
Date: December 1, 1992

ND = Not Detected.

PQL = Practical Quantitation Limit - These are the quantitation limits for this sample. This number is based on sample size, matrix and dilution required.

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d5	93	35 - 114	23 - 120
2-Fluorobiphenyl	89	43 - 116	30 - 115
p-Terphenyl-d14	96	33 - 141	18 - 137
Phenol-d6	90	10 - 94	24 - 113
2-Fluorophenol	89	21 - 100	25 - 121
2,4,6-TBP	89	10 - 123	19 - 122

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QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental - Engineering
Lab No: 27678qc4
Matrix: Soil
Units: ug/kg
Date: December 1, 1992
Dup No: 27678-1

	DUPLICATE			
Compound	Sample (S)	Duplicate (D)	RPD	FLAGS
Phenol	ND	ND	0.0	
bis(2-Chloroethyl) ether	ND	ND	0.0	
2-Chlorophenol	ND	ND	0.0	
1,3-Dichlorobenzene	ND	ND	0.0	
1,4-Dichlorobenzene	ND	ND	0.0	
Benzyl Alcohol	ND	ND	0.0	
1,2-Dichlorobenzene	ND	ND	0.0	
2-Methylphenol	ND	ND	0.0	
bis(2-Chloroisopropyl)ether	ND	ND	0.0	
4-Methylphenol	ND	ND	0.0	
N-Nitroso-Di-N-propylamine	ND	ND	0.0	
Hexachloroethane	ND	ND	0.0	
Nitrobenzene	ND	ND	0.0	
Isophorone	ND	ND	0.0	
2-Nitrophenol	ND	ND	0.0	
2,4-Dimethylphenol	ND	ND	0.0	
Benzoic Acid	ND	ND	0.0	
bis(2-Chloroethoxy)methane	ND	ND	0.0	
2,4-Dichlorophenol	ND	ND	0.0	
1,2,4-Trichlorobenzene	ND	ND	0.0	
Naphthalene	ND	ND	0.0	
4-Chloroaniline	ND	ND	0.0	
Hexachlorobutadiene	ND	ND	0.0	
4-Chloro-3-methylphenol	ND	ND	0.0	
2-Methylnaphthalene	ND	ND	0.0	
Hexachlorocyclopentadiene	ND	ND	0.0	
2,4,6-Trichlorophenol	ND	ND	0.0	
2,4,5-Trichlorophenol	ND	ND	0.0	
2-Chloronaphthalene	ND	ND	0.0	
2-Nitroaniline	ND	ND	0.0	
Dimethyl phthalate	ND	ND	0.0	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental - Engineering
Lab No: 27678qc4
Matrix: Soil
Units: ug/kg
Date: December 1, 1992
Dup No: 27678-1

DUPLICATE

Compound	Sample (S)	Duplicate (D)	RPD	FLAGS
Acenaphthylene	ND	ND	0.0	
3-Nitroaniline	ND	ND	0.0	
Acenaphthene	ND	ND	0.0	
2,4-Dinitrophenol	ND	ND	0.0	
4-Nitrophenol	ND	ND	0.0	
Dibenzofuran	ND	ND	0.0	
2,4-Dinitrotoluene	ND	ND	0.0	
2,6-Dinitrotoluene	ND	ND	0.0	
Diethylphthalate	ND	ND	0.0	
4-Chlorophenyl phenyl ether	ND	ND	0.0	
Fluorene	ND	ND	0.0	
4-Nitroaniline	ND	ND	0.0	
4,6-Dinitro-2-methylphenol	ND	ND	0.0	
N-Nitrosodiphenylamine	ND	ND	0.0	
4-Bromophenyl phenyl ether	ND	ND	0.0	
Hexachlorobenzene	ND	ND	0.0	
Pentachlorophenol	ND	ND	0.0	
Phenanthrene	ND	ND	0.0	
Anthracene	ND	ND	0.0	
Di-n-butylphthalate	4,500	3,200	33.8	X4
Fluoranthene	ND	ND	0.0	
Pyrene	ND	ND	0.0	
Butyl benzyl phthalate	ND	ND	0.0	
3,3'-Dichlorobenzidine	ND	ND	0.0	
Benzo(a)anthracene	ND	ND	0.0	
bis(2-ethylhexyl)phthalate	ND	ND	0.0	
Chrysene	ND	ND	0.0	
Di-n-octyl phthalate	ND	ND	0.0	
Benzo(b)fluoranthene	ND	ND	0.0	
Benzo(k)fluoranthene	ND	ND	0.0	
Benzo(a)pyrene	ND	ND	0.0	
Indeno(1,2,3-cd)pyrene	ND	ND	0.0	
Dibenz(a,h)anthracene	ND	ND	0.0	
Benzo(g,h,i)perylene	ND	ND	0.0	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental - Engineering
Lab No: 27678qc4
Matrix: Soil
Units: ug/kg
Date: December 1, 1992
Dup No: 27678-1

DUPLICATE

ND = Not Detected

RPD = Relative Percent Difference
= [(S - D) / ((S + D) / 2] x 100

SEMIVOLATILE SURROGATES

Surrogate	Sample	Duplicate	Control Limits Water	Control Limits Soil
Nitrobenzene - d5	87	90	35 - 114	23 - 120
2-Fluorobiphenyl	88	96	43 - 116	30 - 115
p-Terphenyl-d14	96	97	33 - 141	18 - 137
Phenol-d6	89	94	10 - 94	24 - 113
2-Fluorophenol	87	91	21 - 100	25 - 121
2,4,6-TBP	95	100	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

SOIL MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental - Engineering
Lab No: 27678qc5
Date: December 1, 1992

SEMI-VOLATILE ORGANICS

COMPOUND	SPIKE (ug/kg)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD
1,2,4-Trichlorobenzene	3,400	ND	2,700	77	2,800	82	6.2
Acenaphthene	3,400	ND	2,900	83	3,100	91	9.2
2,4 Dinitrotoluene	3,400	ND	2,400	69	2,500	73	5.6
Pyrene	3,400	ND	2,900	84	3,900	113	29.0
N-nitrosodi-n-Propylamine	3,400	ND	3,100	90	3,300	95	5.4
1,4-Dichlorobenzene	3,400	ND	2,300	68	2,500	73	7.1
Pentachlorophenol	3,400	ND	2,100	61	2,300	66	7.9
Phenol	3,400	ND	2,700	78	2,900	84	7.4
2-Chlorophenol	3,400	ND	3,000	88	3,200	94	6.6
4-Chloro-3-Methylphenol	3,400	ND	3,000	87	2,500	74	7.7
4-Nitrophenol	3,400	ND	1,500	44	2,000	57	26.0

RPD = Relative Percent Difference
% REC = Percent Recovery

*QC Limits:	RPD	% RECOVERY
1,2,4-Trichlorobenzene	23	38-107
Acenaphthene	19	31-137
2,4 Dinitrotoluene	47	28-89
Pyrene	36	35-142
N-nitrosodi-n-Propylamine	38	41-126
1,4-Dichlorobenzene	27	28-104
Pentachlorophenol	47	17-109
Phenol	35	26-90
2-Chlorophenol	50	25-102
4-Chloro-3-Methylphenol	33	26-103
4-Nitrophenol	50	11-114

* These are advisory limits only.